Sharebrook Estate and Safari Park

Sharebrook Estate and Safari Park

Task Scenario

You have been asked to create a database for Sharebrook Estate and Safari Park. The attractions include a private rail track. It has an old steam engine and two carriages that are used for events. Evening Christmas events have been planned for 20 to 22 December. The database will record information about:

- events
- customers
- event sales.

Each event has a different ticket price.

There are two types of seat: seats without tables and seats with tables.

There must be at least one ticket purchased with each sale.

A sale cannot exceed eight tickets.

Examining the data

Seat Sale ID	Event ID	Customer ID	Event Description	Surname	Event Date	House Number	Postcode	Seat Type	Event Ticket Price	Num Tickets
1	1	1	Christmas Songtime	Bell	20/12/2021	7	FE3 1LM	Table	£10.00	2
2	1	2	Christmas Songtime	Squires	20/12/2021	12	ME3 2GG	No Table	£10.00	1
3	2	3	The Polar Express	Hudson	21/12/2021	1	FE3 5HJ	Table	£15.00	4
4	2	72	The Polar Express	Williams	21/12/2021	6a	ME4 2LS	No Table	£15.00	2
6	3	1	Home Alone	Bell	22/12/2021	7	FE3 1LM	Table	£12.50	4
7	3	69	Home Alone	Ferguson	22/12/2021	Greylands	DL8 1TH	No Table	£12.50	8

Examining the Data - Questions:

What data type would you set for House Number?
How many different events are there?
How many different customers are there?
How many different seat types are there?
Which data is repeated?
What tables are required?
Which fields belong to which table?

Deciding on a database structure

Event ID
Event Description
Event Date
Event Ticket Price

Seat Sale ID
Seat Type
Num Tickets

Customer ID
Surname
House Number
Postcode

Question - in the Seat Sale Table - how do we know which Event is being booked?
Question - in the Seat Sale Table - how do we know who is booking?

Deciding on a database structure

Event ID
Event Description
Event Date
Event Ticket Price

Seat Sale ID
Event ID
Customer ID
Seat Type
Num Tickets

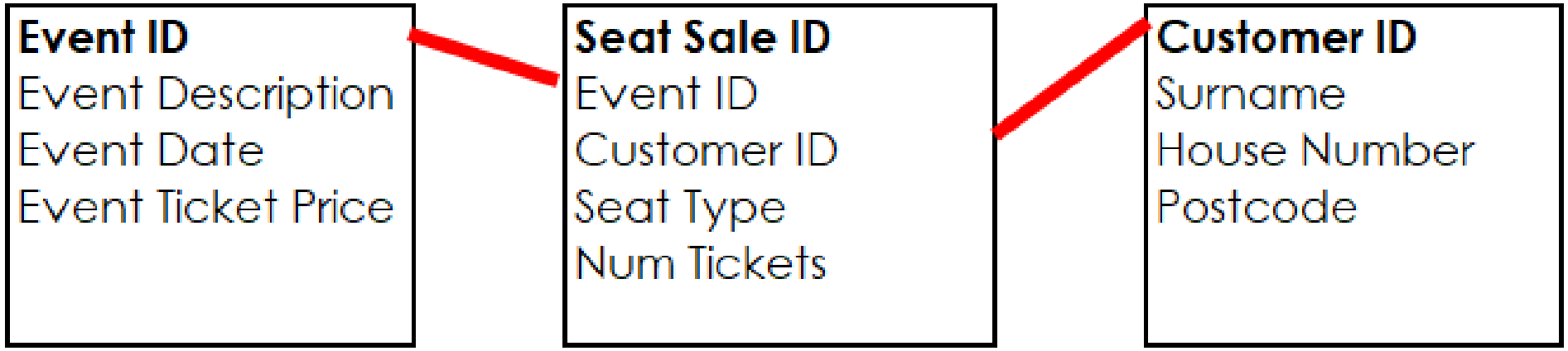
Customer ID
Surname
House Number
Postcode

Question - in the Seat Sale Table - how do we know which Event is being booked?
Answer - by putting the Event ID in the Seat Sale Table

Question - in the Seat Sale Table - how do we know who is booking?
Answer - by putting the Customer ID in the Seat Sale Table

Question: How do we link (relate) the tables?

Creating Relationships



Question: How do we link (relate) the tables
Answer: Through common fields (Key fields)

Activity 1: Database relationships screenprint (45 minutes) – 8 marks

Activity 1: Database relationships screenprint (45 minutes)

Study the data extract provided in **Figure 1**. Create an efficient database structure that:

- minimises data duplication
- accepts the data provided
- uses recognised naming conventions
- ensures data integrity.

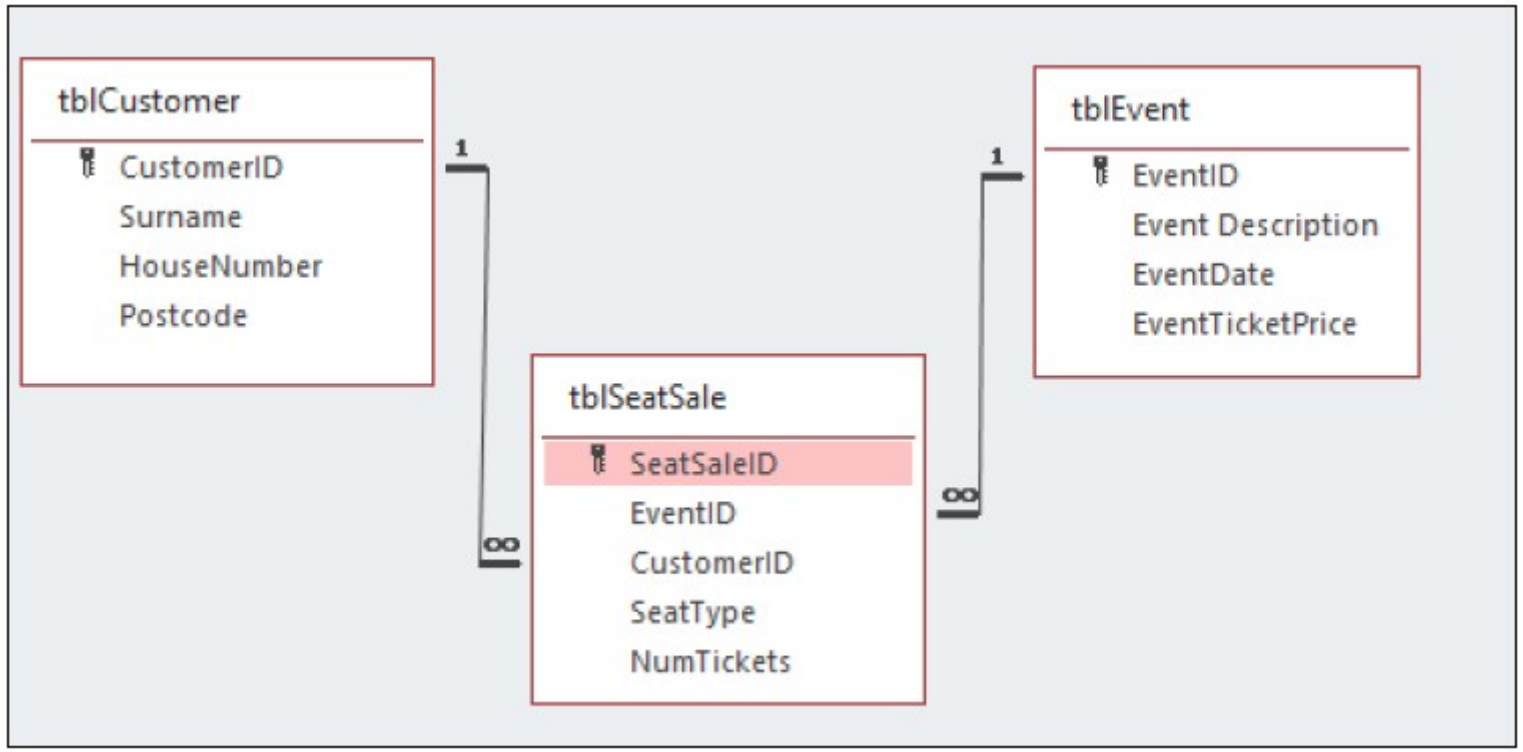
Ensure you use **all** and **only** the fields shown in **Figure 1**.
Screen print your database relationships.
You are advised to spend 45 minutes on this activity.

Activity 1 explained

Create an efficient database structure that:

- minimises data duplication - this is achieved by creating a sensible structure (tables)
- accepts the data provided – this is achieved by selecting the correct data types and field sizes
- uses recognised naming conventions – using the correct prefixes – e.g. tblCustomer
- ensures data integrity – a structure that requires minimal repetition of data

Activity 1: Database relationships screenprint (45 minutes) – 8 marks - answers



Activity 2: Table structures and validation (45 minutes) – 8 marks

Create efficient table structures based on Activity 1 and the data shown in **Figure 1**.

The table structures must use suitable validation to meet these requirements:

1. A record will not save without the surname, house number and postcode of the customer being present
2. A record will not save if the postcode is not in the correct format
3. A record will not save if the event selected is invalid
4. A record will not save if the seat type is invalid
5. A record will not save if the number of tickets purchased is below the accepted range
6. A record will not save if the number of tickets purchased is above the accepted range

Input the data you have been given into your relational database.

Activity 2: Table structures and validation (45 minutes) – 8 marks - answers

Table Structures

Add screenprints of each of your tables in design view showing the table names, field names and data types ONLY

tblCustomer

Field Name	Data Type
CustomerID	Number
Surname	Short Text
HouseNumber	Short Text
Postcode	Short Text

tblEvent

Field Name	Data Type
EventID	AutoNumber
Event Description	Short Text
EventDate	Date/Time
EventTicketPrice	Currency

tblSeatSale

Field Name	Data Type
SeatSaleID	AutoNumber
EventID	Number
CustomerID	Number
SeatType	Short Text
NumTickets	Number

Activity 2: Table structures and validation (45 minutes) – 8 marks

1. **A record will not save without the surname, house number and postcode of the customer being present – Presence Check (Required or Validation Rule)**

Example: Customer Name

General | Lookup

Field Size	20
Format	
Input Mask	
Caption	
Default Value	
Validation Rule	Is Not Null
Validation Text	You must enter the customer's surname
Required	No
Allow Zero Length	Yes
Indexed	No
Unicode Compression	Yes
IME Mode	No Control
IME Sentence Mode	None
Text Align	General

Activity 2: Table structures and validation (45 minutes) – 8 marks

2. **A record will not save if the postcode is not in the correct format – Format Check (Input Mask)**

Character	Meaning
>	Converts all characters that follow to uppercase
L	Must enter a letter
0	Must enter a digit (0-9)
\	Characters immediately following will be displayed literally (e.g. space)

General | Lookup

Field Size	7
Format	
Input Mask	>LL0\ 0LL
Caption	
Default Value	
Validation Rule	Is Not Null
Validation Text	You must enter the customer's postcode
Required	No
Allow Zero Length	Yes
Indexed	Yes (Duplicates OK)
Unicode Compression	Yes
IME Mode	No Control
IME Sentence Mode	None
Text Align	General

Input Masks

A copy is in your Notebook

Character	Explanation
0	User must enter a digit (0 to 9).
9	User can enter a digit (0 to 9).
#	User can enter a digit, space, plus or minus sign. If skipped, Access enters a blank space.
L	User must enter a letter.
?	User can enter a letter.
A	User must enter a letter or a digit.
a	User can enter a letter or a digit.
&	User must enter either a character or a space.
C	User can enter characters or spaces.
. , : ; - /	Decimal and thousands placeholders, date and time separators. The character you select depends on your Microsoft Windows regional settings.
>	Coverts all characters that follow to uppercase.
<	Converts all characters that follow to lowercase.
!	Causes the input mask to fill from left to right instead of from right to left.
\	Characters immediately following will be displayed literally.
""	Characters enclosed in double quotation marks will be displayed literally.

Activity 2: Table structures and validation (45 minutes)
8 marks

3. **A record will not save if the event selected is invalid – Validation Rule**

Event Description

General | Lookup

Field Size	60
Format	
Input Mask	
Caption	
Default Value	
Validation Rule	"Christmas Songtime" Or "The Polar Express" Or "Home Alone"
Validation Text	You must enter an appropriate event description
Required	No
Allow Zero Length	Yes
Indexed	No
Unicode Compression	No
IME Mode	No Control
IME Sentence Mode	None
Text Align	General

Activity 2: Table structures and validation (45 minutes)
8 marks

4. A record will not save if the seat type is invalid

Seat Type

tblCustomer | tblEvent | tblSeatSale

SeatSaleID	EventID	CustomerID	SeatType	NumTickets	Click to Add
1	1	1	Table	2	
2	1	2	Table	1	
3	2	3	No Table	4	
4	2	72	No Table	2	
5	3	1	Table	4	
6	3	69	No Table	8	
* (New)				0	

Activity 2: Table structures and validation (45 minutes)
8 marks

5. **A record will not save if the number of tickets purchased is below the accepted range**
6. **A record will not save if the number of tickets purchased is above the accepted range**

Number of Tickets

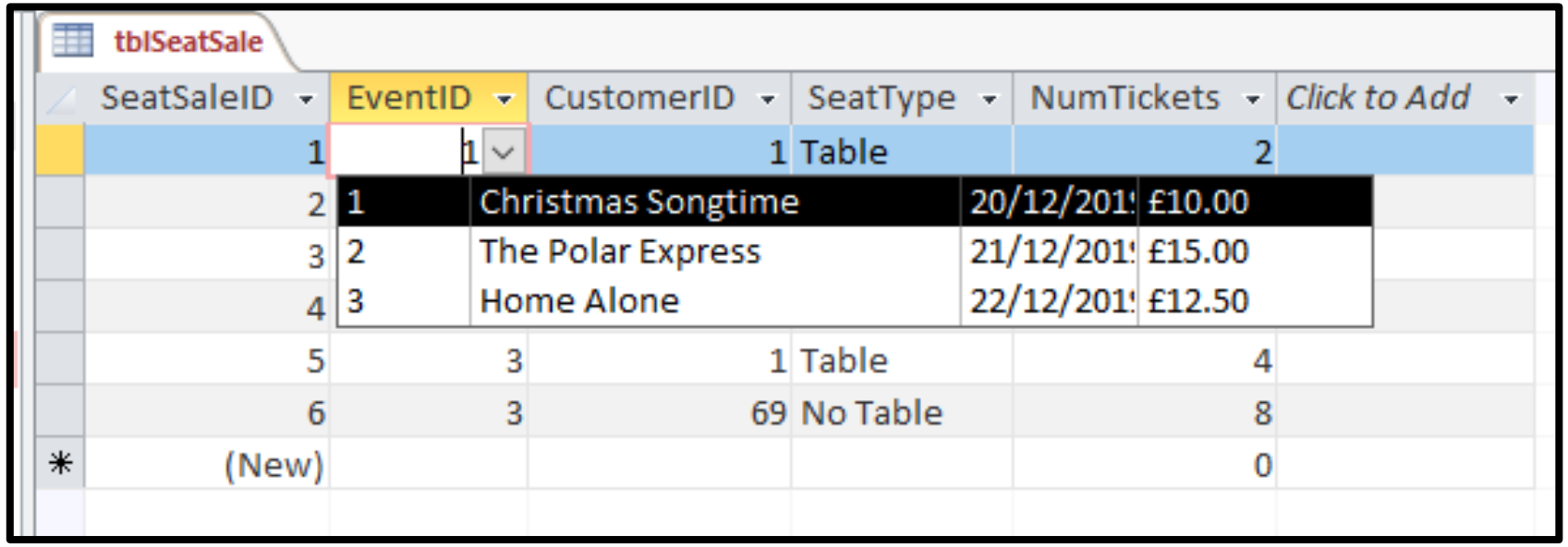
General | Lookup

Field Size	Long Integer
Format	
Decimal Places	Auto
Input Mask	
Caption	
Default Value	0
Validation Rule	Is Not Null And Between 1 And 8
Validation Text	Must be at least 1 ticket bought and no more than 8
Required	No
Indexed	Yes (Duplicates OK)
Text Align	General

Activity 2: Table structures and validation (45 minutes)
8 marks

Additional Validation - Table lookup:

On ‘Foreign Keys’



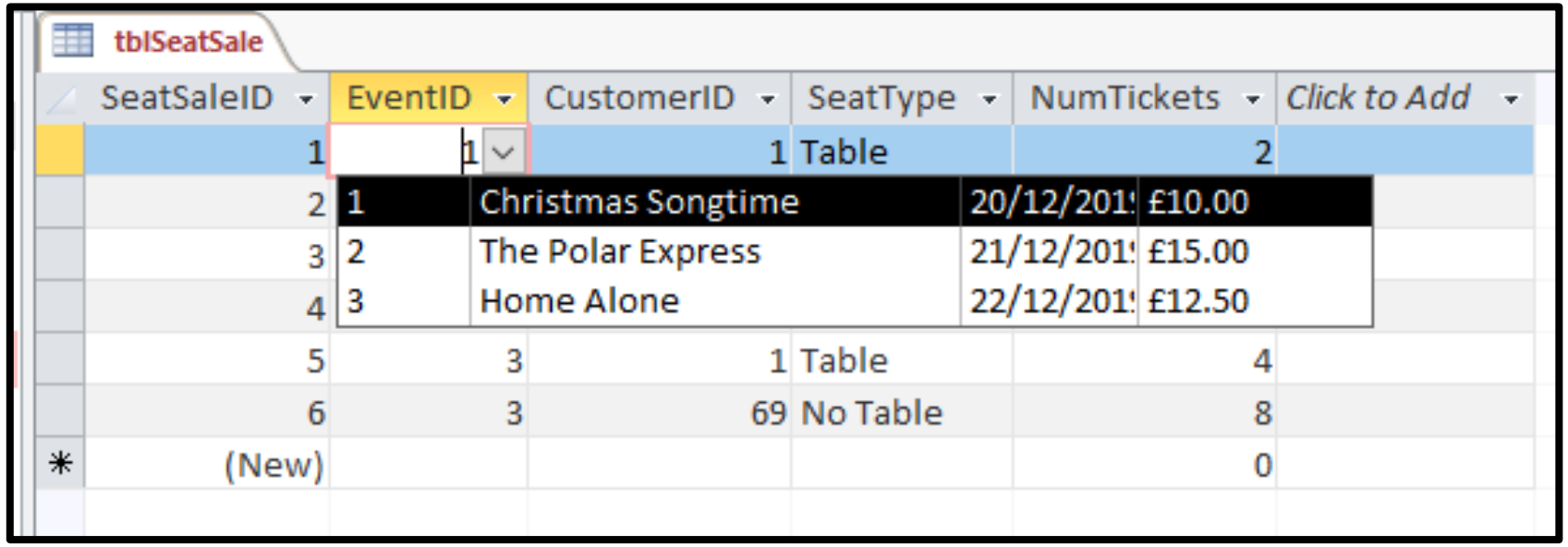
See ‘How to’ on the next slide.

Activity 2: Table structures and validation (45 minutes)
8 marks

Additional Validation - Table lookup on tblSeatSale:

On ‘Foreign Keys’

The purpose is to help the user to identify the correct ID number when entering data



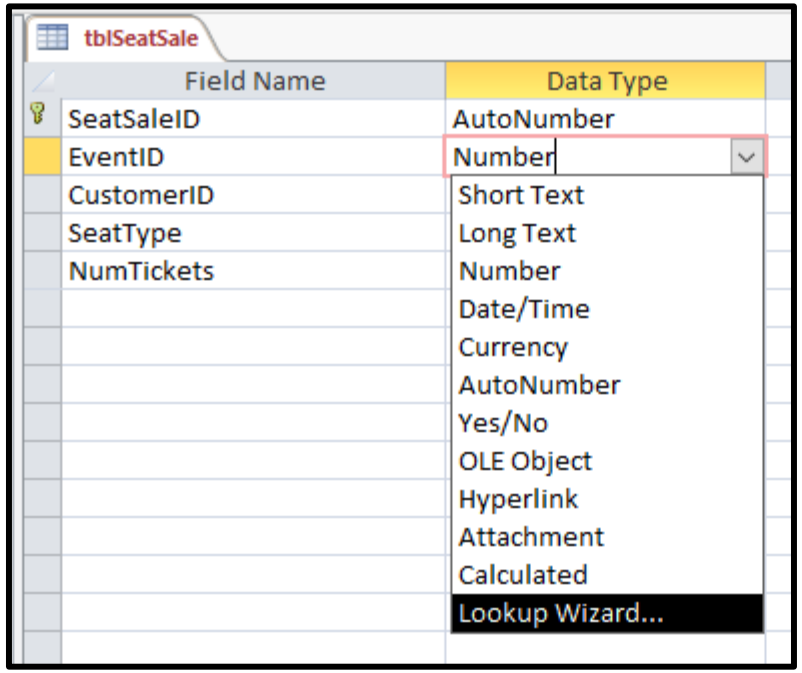
See ‘How to’ on the next slide.

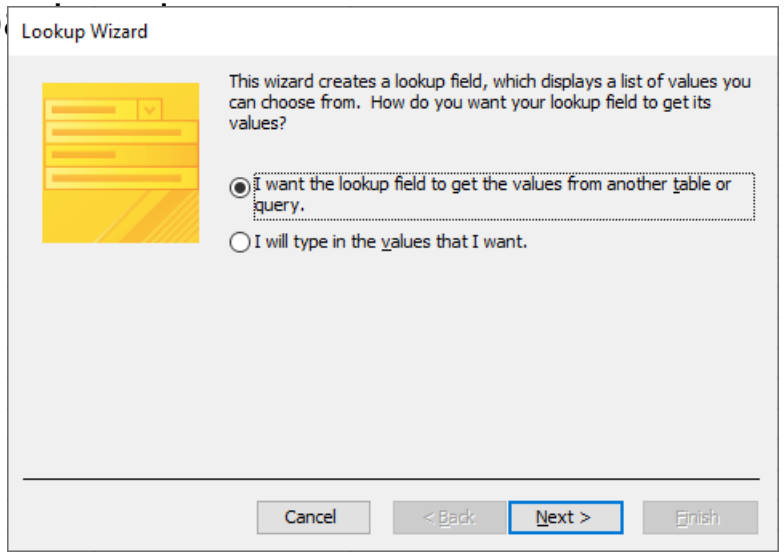
How to: Table lookup on tblSeatSale:

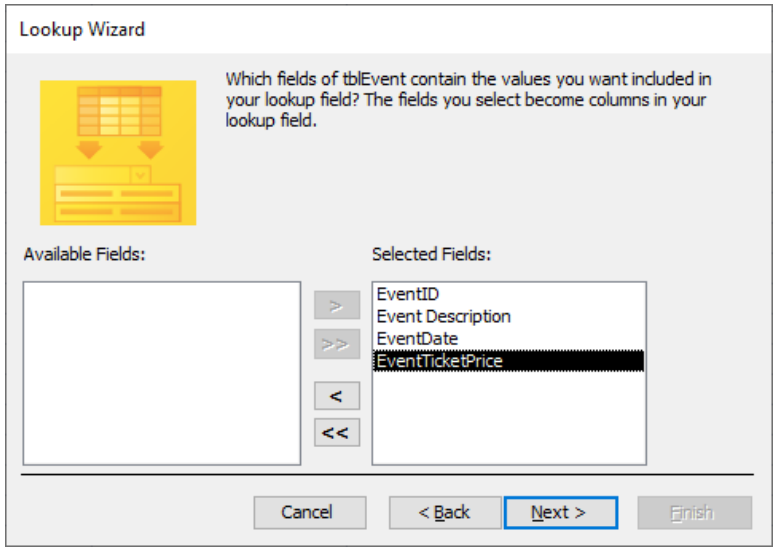
On tblSeatSale, select ‘EventID’ and choose ‘Lookup Wizard’. Note that if you have already created relationships you will be prompted to delete these first.

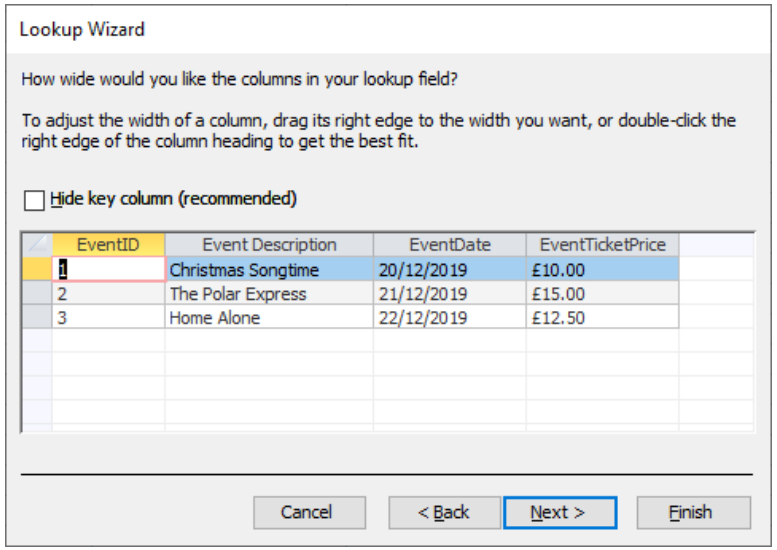
In the first window of the wizard, select ‘I want the lookup field to get the values from another table or query’

In the next window choose tblEvent (where event details are stored) – then choose the fields that you want to see in the lookup list. Finally, unhide the key column and stretch the columns so all data can be seen. Click finish, add relationships b









Activity 2: Table structures and validation (45 minutes)
8 marks

Screen Prints for Activity 2:

Display your screenprints on your Notebook to show:

- the design view of each table showing the structure, including the fields and data types

- validation including a suitable example for each of these:
    - presence check
    - length check
    - value lookup or range check
    - table lookup
    - format check.

Activity 3: Queries and Report (40 mins) – 12 marks

Queries

a) Create a query to display an alphabetically sorted list of the events running on the 20th and 21st of December. It must show event description and event ticket price only.

b) Create a query that will calculate:
   i. the number of table tickets sold
   ii. the income for the tickets sold.

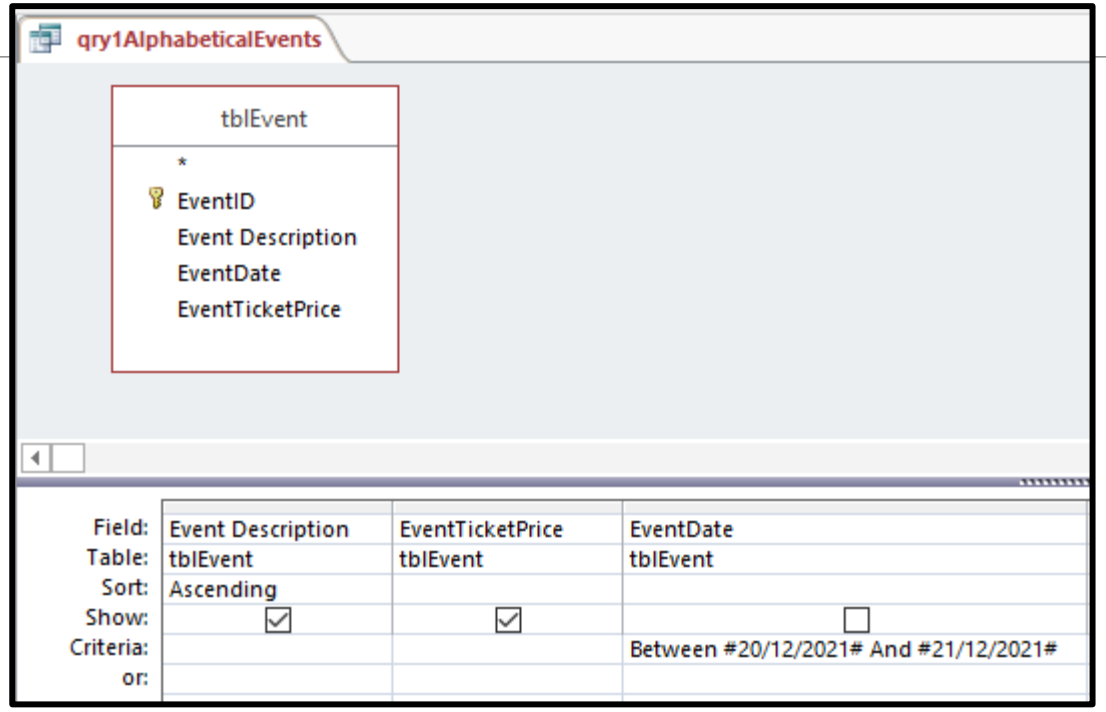
Display:
- the event description
- the number of table seat tickets sold
- the income generated.

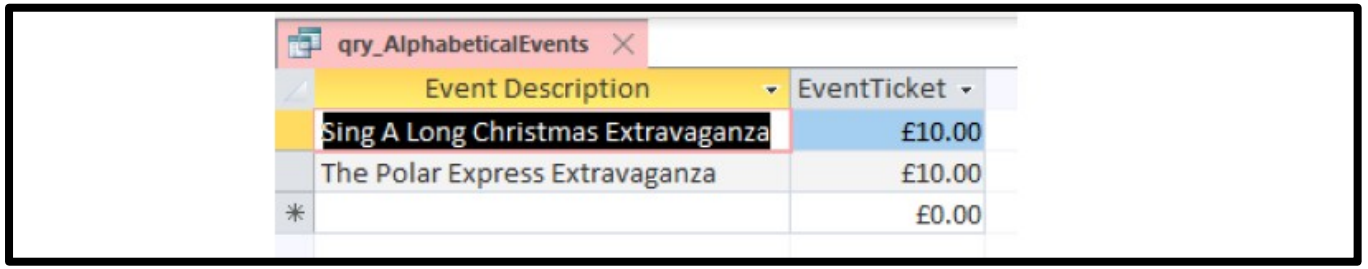
Activity 3: Queries and Report (40 mins) – 12 marks

Queries

a) Create a query to display an alphabetically sorted list of the events running on the 20th and 21st of December. It must show event description and event ticket price only.

See ‘How to’ on the next slide

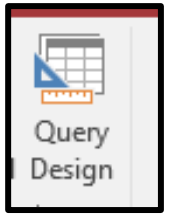




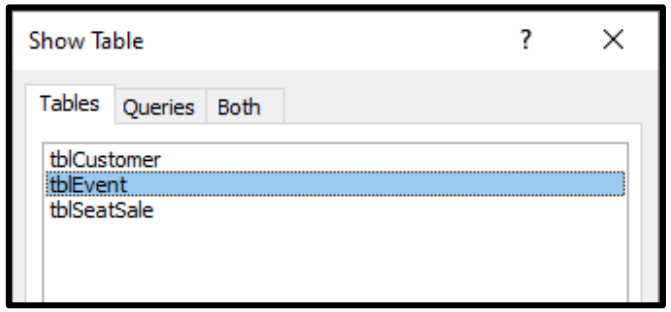
a) Create a query to display an alphabetically sorted list of the events running on the 20th and 21st of December. It must show event description and event ticket price only.

‘How to’:

Click on the ‘Create’ menu and select ‘Query Design’



The window that opens asks you to select the required table to return the necessary information. In this case we only need tblEvent – double click or use the ‘Add’ button.

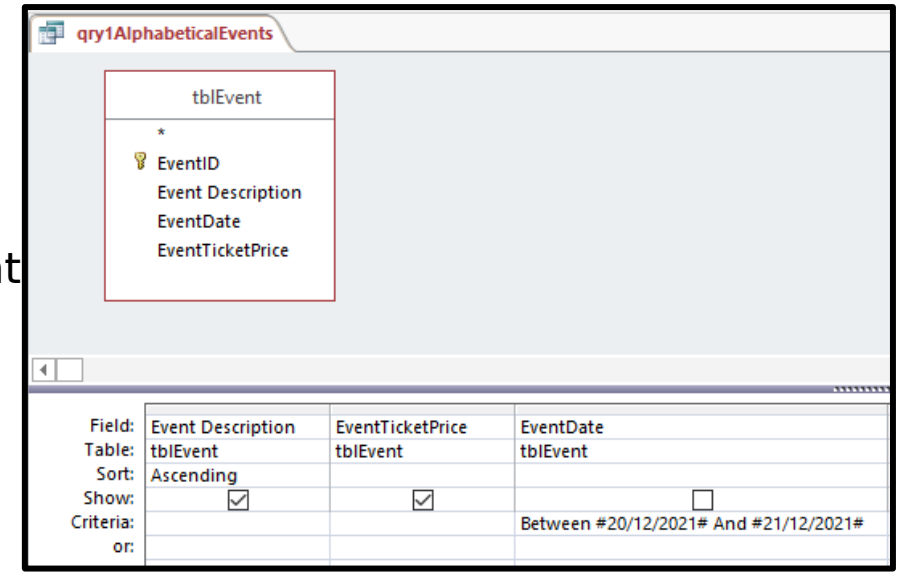


Double click on the fields required to return the requested information – they will appear in the ‘query grid’ below. Read the instruction carefully so that you only choose relevant fields – Event Description, Event Ticket Price and Event Date

Type the criteria Between 20/12/2021 and 21/12/2021 under the Event Date. Untick the ‘Show’ box (date not required to show).

Run the query to test that only two records show.

Name the report qryAlphabeticalEvents



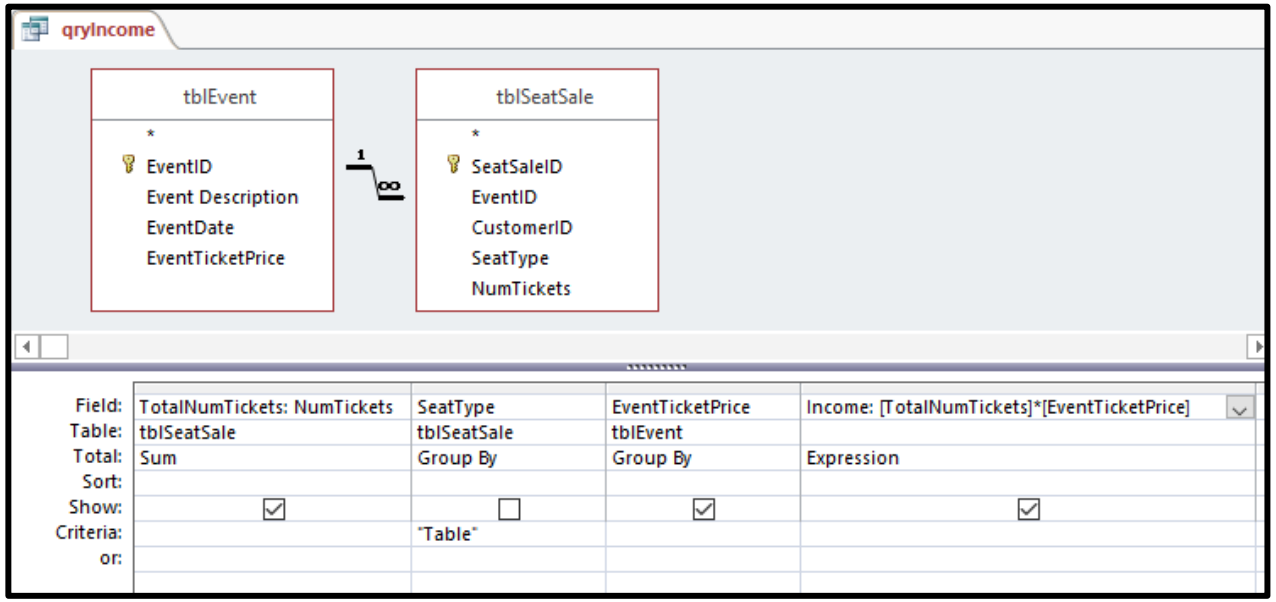
Activity 3: Queries and Report (40 mins) – 12 marks

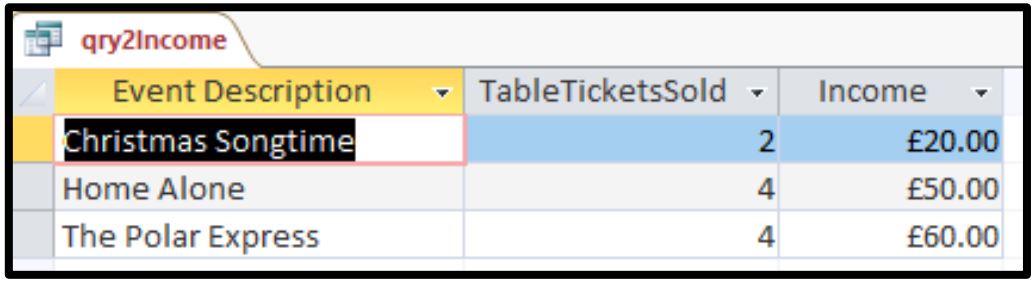
Queries

b) Create a query that will calculate:
   i. the number of table tickets sold
   ii. the income for the tickets sold.

Display:
- the event description
- the number of table seat tickets sold
- the income generated.

See 'How to' on next slides





Event Description	TableTicketsSold	Income
Christmas Songtime	2	£20.00
Home Alone	4	£50.00
The Polar Express	4	£60.00

b) Create a query that will calculate:
   i. the number of table tickets sold
   ii. the income for the tickets sold.

Display:
- the event description
- the number of table seat tickets sold
- the income generated.

‘How To’

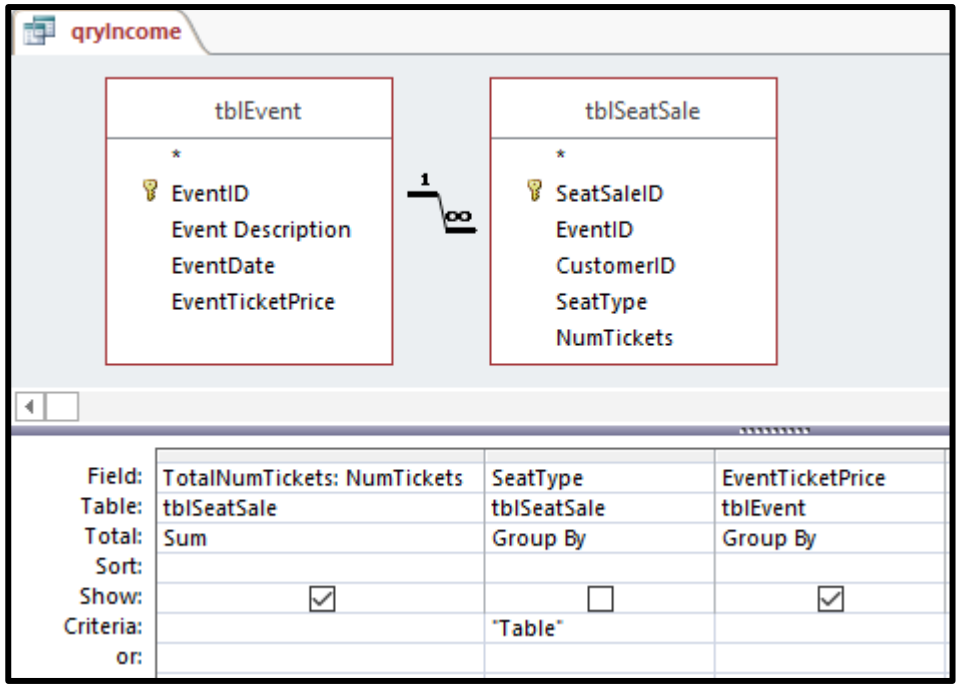
Step 1: Select ‘Create’ and ‘Query Design’ and create the query as shown. Add the criteria ‘Table as shown’ (remove the tick from show). Note that initially 6 records will be returned until we do some grouping.

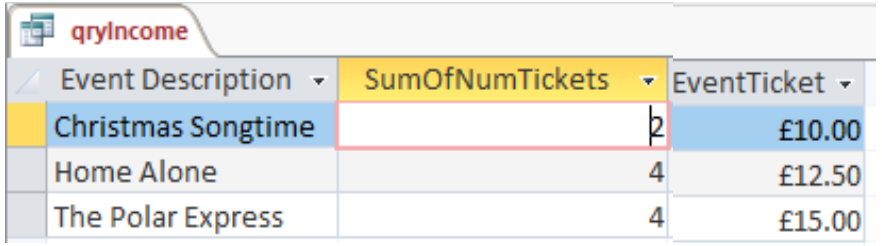
Step 2: Click on the ‘Totals’ button – this will give extra row in the query to do some calculations.

Step 3 – in the ‘Total’ row, under NumTickets, choose ‘Sum’. This will address bullet point 2 of the question.

Note that when you run the query it changes to name of the calculated field to ‘SumOfNumTickets’.

You can change this easily to something more sensible.





Event Description	SumOfNumTickets	EventTicket
Christmas Songtime	2	£10.00
Home Alone	4	£12.50
The Polar Express	4	£15.00

See next slide

b) Create a query that will calculate:
   i. the number of table tickets sold
   ii. the income for the tickets sold.

'How To'

Step 4: Change the name of the calculated field – note that you will want to use this name in the next step. Click into 'Design' view. Type a name 'TotalNumTickets:' in front of the field NumTickets – don't forget the colon (:).

Step 5: Calculate the income generated (third bullet point). In a spare column (column 5) you will type in the required calculation. We want to multiply the total number of tickets sold by the ticket price to work out the total income.

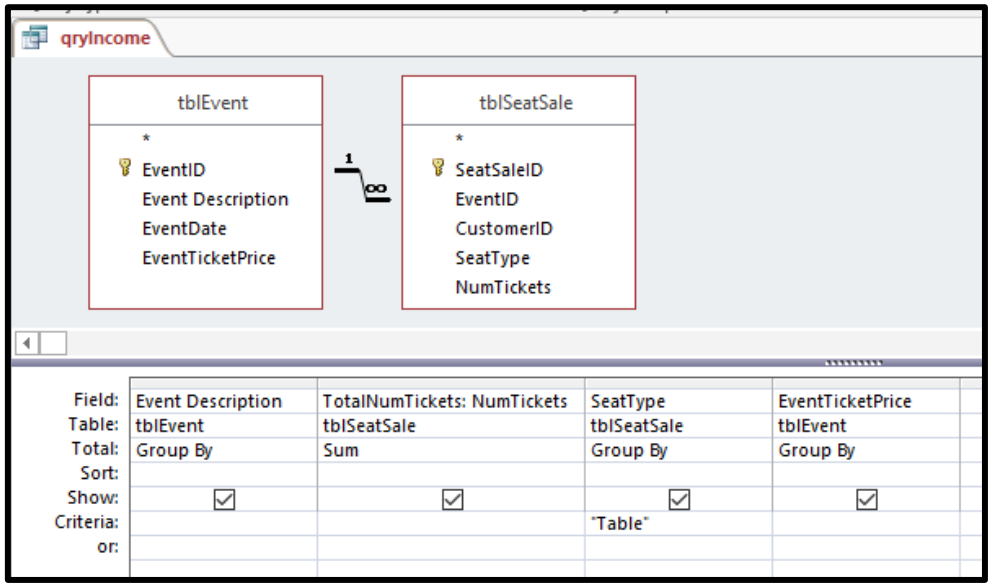
Type in: TotalNumTickets*EventTicketPrice

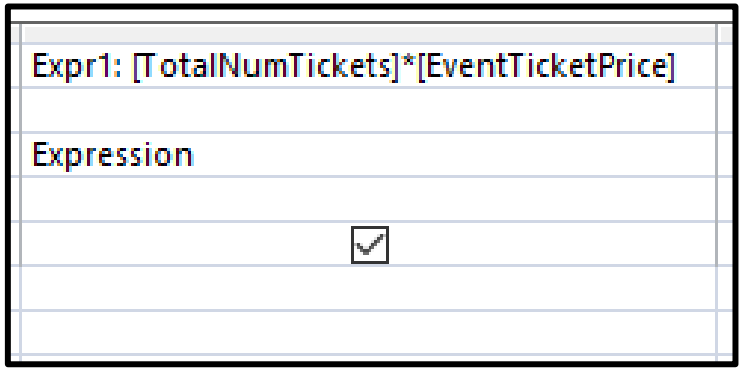
Note that * means multiply. Square brackets will be automatically added.

You can change the name 'Expr1' as above

Display:

- the event description
- the number of table seat tickets sold
- the income generated.



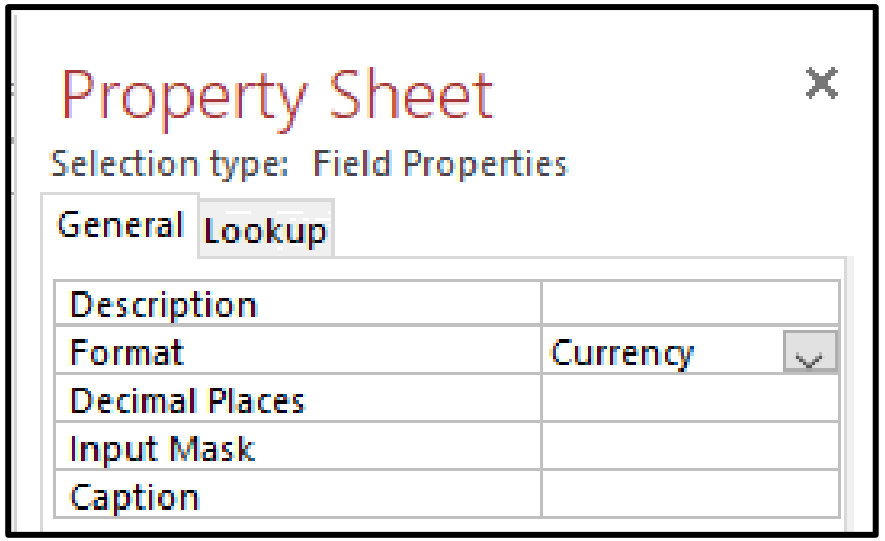


b) Create a query that will calculate:
   i. the number of table tickets sold
   ii. the income for the tickets sold.

Display:
- the event description
- the number of table seat tickets sold
- the income generated.

'How To'

Step 6: Change the format of the income generated to currency. Click in that field and select 'Property Sheet'. You will see the property sheet of the selected field on the right hand side of the screen. Select 'Currency' in the 'Format' property.



View the results

qryIncome

Event Description	TotalNumTickets	EventTicket	Income
Christmas Songtime	2	£10.00	£20.00
Home Alone	4	£12.50	£50.00
The Polar Express	4	£15.00	£60.00

Activity 3: Queries and Report (40 mins) – 12 marks

Report (based on a Query)

c) Create a report that shows ticket sales for the events. For each event calculate:
   - the number of customers who have purchased tickets
   - the number of table tickets purchased
   - the number of non table tickets purchased
   - the total number of tickets purchased

Display:

- a suitable report title
- the event descriptions
- the number of customers who have purchased tickets
- the number of table tickets purchased for each event
- the number of non table tickets purchased for each event
- the total number of tickets purchased for each event

The report must fit on one page. **Important note:** you will need to convert the report to a pdf and save in your folder – next step (item d)

c) Create a report that shows ticket sales for the events. For each event calculate:

- the number of customers who have purchased tickets
- the number of table tickets purchased
- the number of non-table tickets purchased
- the total number of tickets purchased

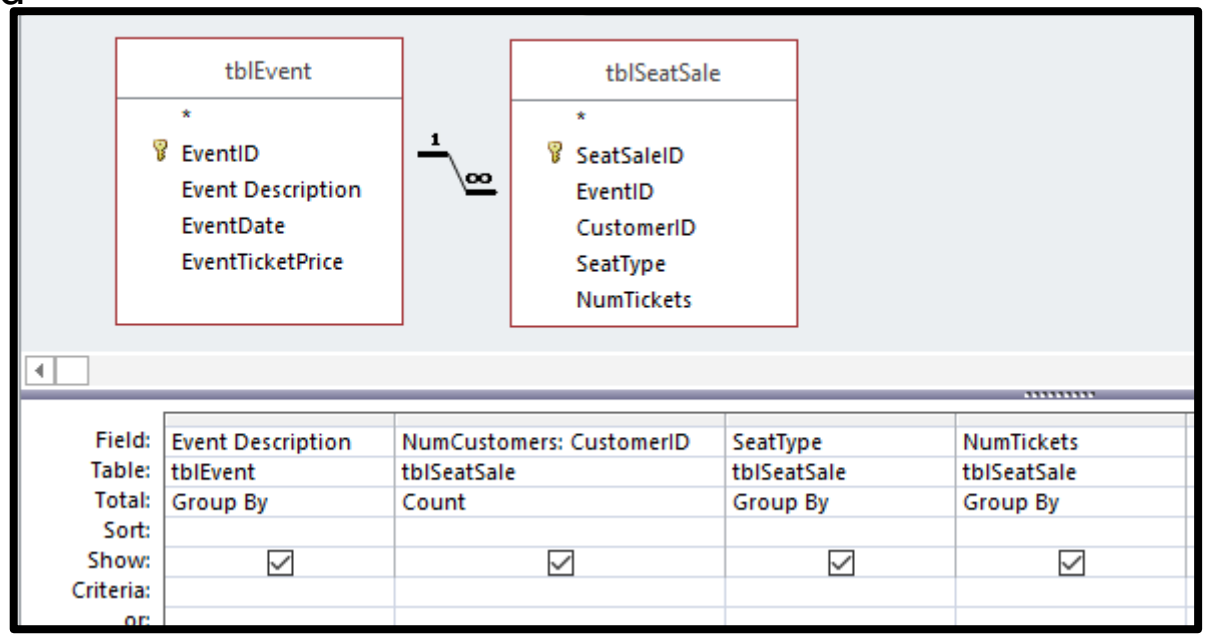
‘How to’ Step 1: The Query

Create this query – which in the next step will be used to create a report.

We will do the calculation for the first bullet point on this query, but will do the other calculations directly on the report.

Click on the ‘Totals’ button to give us the ‘Total’ row in the query (see right). On the ‘Customer ID’ select ‘Count’.

Because there is very little data in our database there are a limited number of customers that have booked – but the results are correct (examine your tblSeatSale to confirm).



Event Description	NumCustomers	SeatType	NumTickets
Christmas Songtime	1	No Table	1
Christmas Songtime	1	Table	2
Home Alone	1	No Table	8
Home Alone	1	Table	4
The Polar Express	1	No Table	2
The Polar Express	1	Table	4

c) Create a report that shows ticket sales for the events. For each event calculate:
   - the number of customers who have purchased tickets
   - the number of table tickets purchased
   - the number of non-table tickets purchased
   - the total number of tickets purchased

Display:

- a suitable report title
- the event descriptions
- the number of customers who have purchased tickets
- the number of table tickets purchased for each event
- the number of non table tickets purchased for each event
- the total number of tickets purchased for each event

This is what you will create. Look at the bullet points and identify where each of those things are on the report.

'How to' on the next few slides.

Ticket Sales Report

Event Description	Total Customers	Seat Type	Number of Tickets Sold
Christmas Songtime			
	1	No Table	1
	1	Table	2
Total for Christmas Songtime	2		3
Home Alone			
	1	No Table	8
	1	Table	4
Total for Home Alone	2		12
The Polar Express			
	1	No Table	2
	1	Table	4
Total for The Polar Express	2		6
Grand Total	**6**		**21**

21 September 2021 Page 1 of 1

‘How to’ – Report Wizard

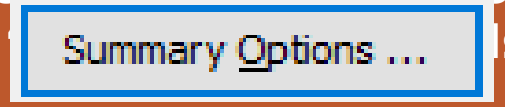
Click on the Query (qryRptTicketSales)

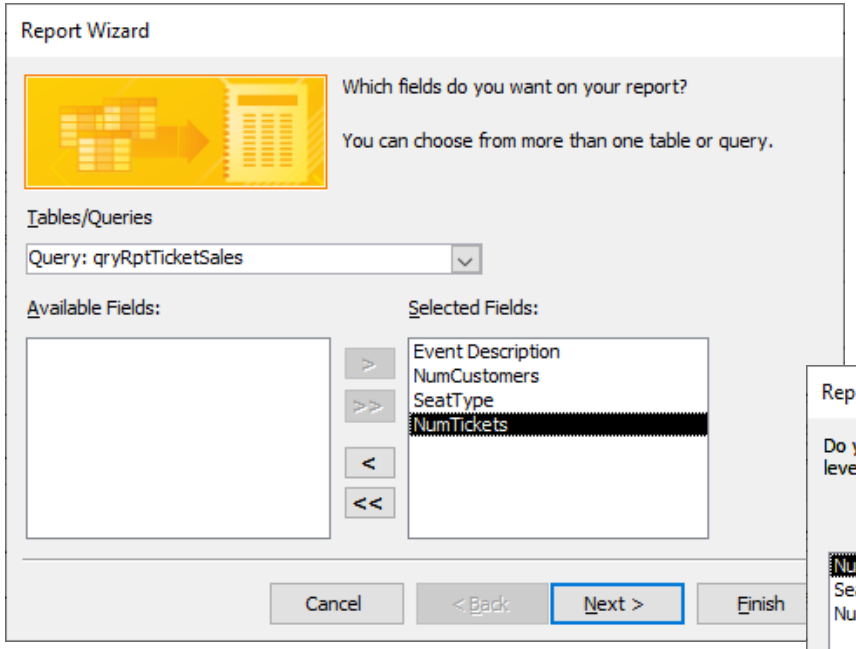
Select ‘Create’ and ‘Report Wizard’

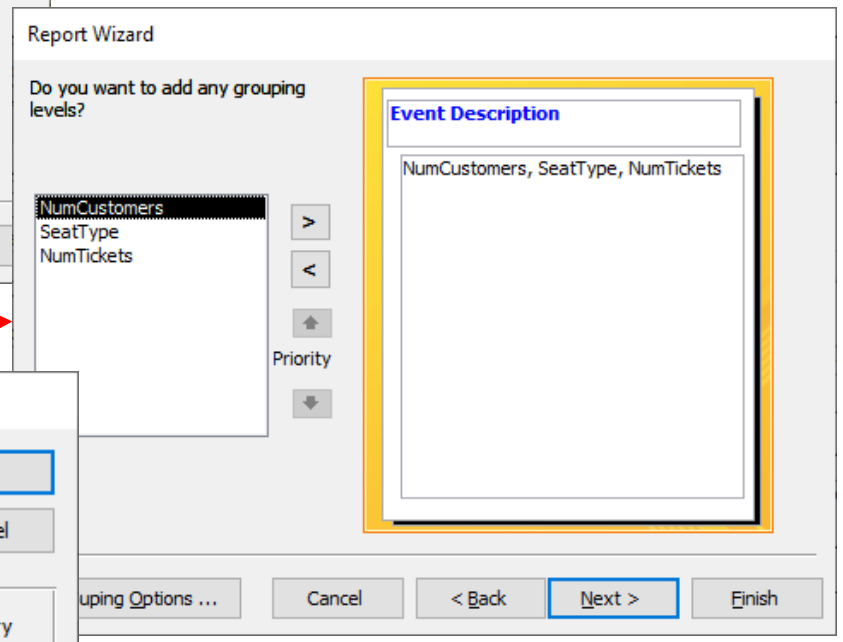
Choose all fields

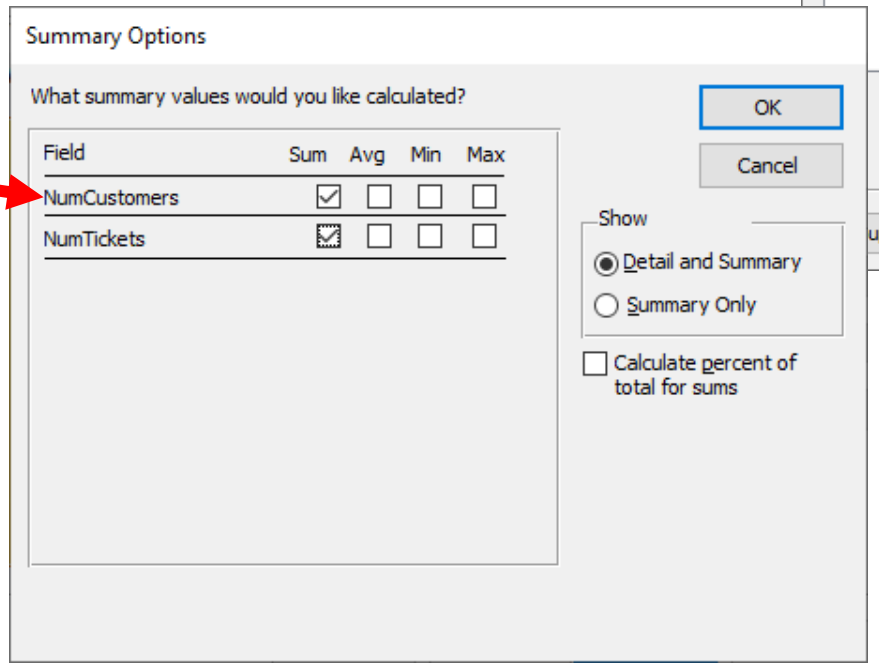
Group by ‘Event Description’

Choose ‘Summary Options’ and tick fields









Activity 3: Queries and Report (40 mins) – 12 marks

Initially the report will look like this - adjust in Design View to make it look more attractive. This is where many of the marks will be achieved.

Examine the tools that you can use on the top ribbon in Design View.

qryRptTicketSales1

Event Description	NumCustomers	SeatType	NumTickets
Christmas Songtime	1	No Table	1
	1	Table	2
Summary for 'Event Description' = Christmas Songtime (2 detail records)			
Sum	2		3
Home Alone	1	No Table	8
	1	Table	4
Summary for 'Event Description' = Home Alone (2 detail records)			
Sum	2		12
The Polar Express	1	No Table	2
	1	Table	4
Summary for 'Event Description' = The Polar Express (2 detail records)			
Sum	2		6
Grand Total	6		21

Display:

- **a suitable report title**
- **the event descriptions**
- **the number of customers who have purchased tickets**
- **the number of table tickets purchased for each event**
- **the number of non table tickets purchased for each event**
- **the total number of tickets purchased for each event**

qryRptTicketSales1

Event Description	NumCustomers	SeatType	NumTickets
Christmas Songtime	1	No Table	1
	1	Table	2
Summary for 'Event Description' = Christmas Songtime (2 detail records)			
Sum	2		3
Home Alone	1	No Table	8
	1	Table	4
Summary for 'Event Description' = Home Alone (2 detail records)			
Sum	2		12
The Polar Express	1	No Table	2
	1	Table	4
Summary for 'Event Description' = The Polar Express (2 detail records)			
Sum	2		6
Grand Total	6		21

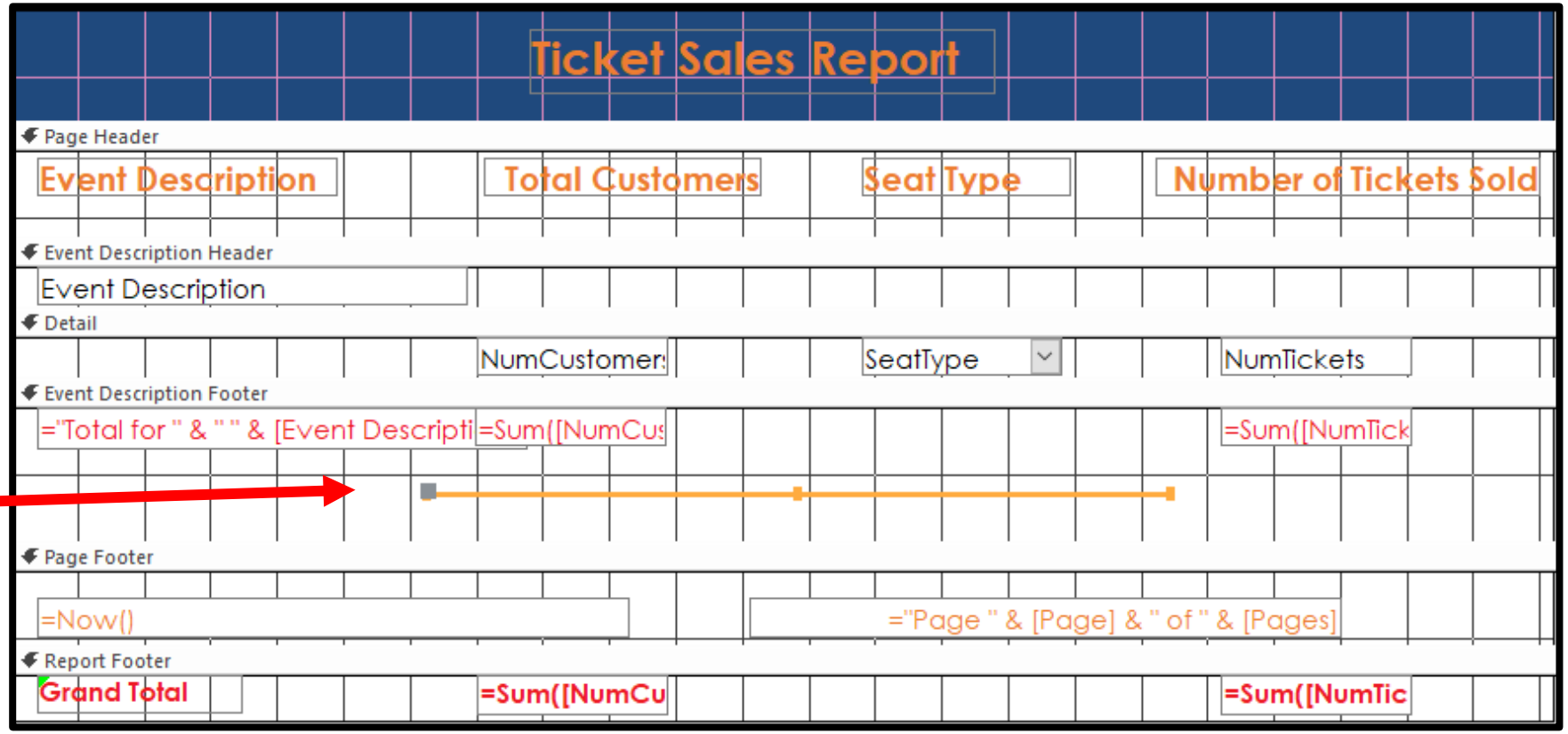
For maximum marks you must adjust the report in 'Design View' to make it look more attractive - see next slide.

Close Print Preview (on the right of the screen) and then go to 'View' and 'Design View' (on the left of the screen).

Activity 3: Queries and Report (40 mins) – 12 marks

Absolute musts:

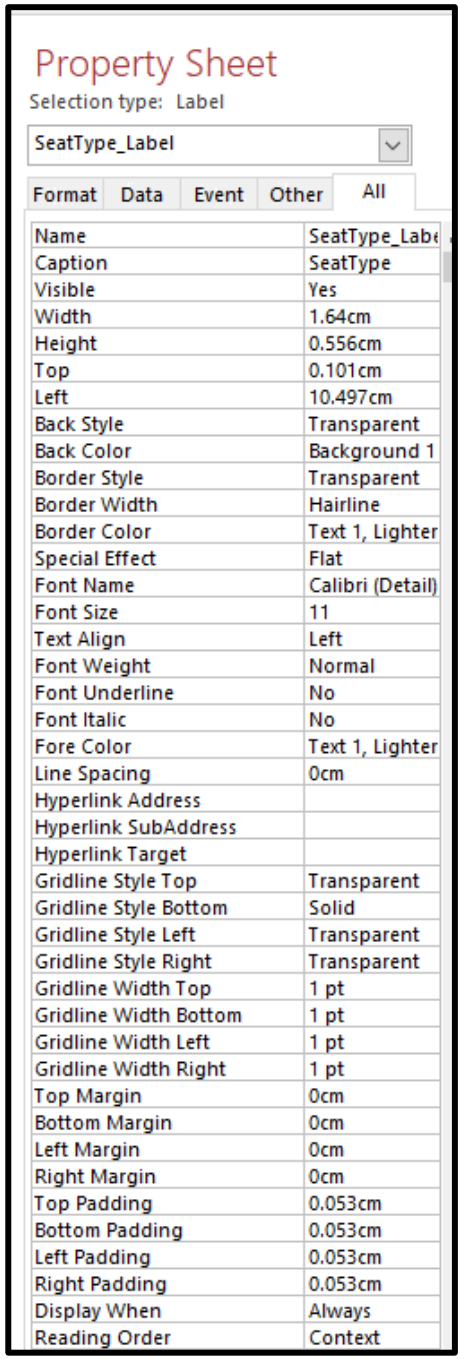
- Change the heading to a sensible report heading, e.g. 'Ticket Sales Report'
- Change the 'labels' – e.g. 'NumCustomers' should read 'Total Customers'
- Adjust the label, text and column sizes so all text can be seen (in Print Preview)
- Choose a colour scheme
- You could add little extras like a separator if you wish



Keep flicking between Print Preview and Design View to examine your changes.

Extension:

- **Examine the ‘Properties’ of each component on the report.**
- **Note that as you click on different elements on the report the properties for that element appear on the right hand side in the Property Sheet.**
- **To see the properties of the entire form you click on the small square on the top left corner of the report.**
- **Try to differentiate between a text box and a label. Examine the properties of each to see if you can work out the difference (clue ‘Total Customers’ is a label and**



Property Sheet

Selection type: Label

SeatType_Label

Format | Data | Event | Other | All

Name	SeatType_Labe
Caption	SeatType
Visible	Yes
Width	1.64cm
Height	0.556cm
Top	0.101cm
Left	10.497cm
Back Style	Transparent
Back Color	Background 1
Border Style	Transparent
Border Width	Hairline
Border Color	Text 1, Lighter
Special Effect	Flat
Font Name	Calibri (Detail)
Font Size	11
Text Align	Left
Font Weight	Normal
Font Underline	No
Font Italic	No
Fore Color	Text 1, Lighter
Line Spacing	0cm
Hyperlink Address	
Hyperlink SubAddress	
Hyperlink Target	
Gridline Style Top	Transparent
Gridline Style Bottom	Solid
Gridline Style Left	Transparent
Gridline Style Right	Transparent
Gridline Width Top	1 pt
Gridline Width Bottom	1 pt
Gridline Width Left	1 pt
Gridline Width Right	1 pt
Top Margin	0cm
Bottom Margin	0cm
Left Margin	0cm
Right Margin	0cm
Top Padding	0.053cm
Bottom Padding	0.053cm
Left Padding	0.053cm
Right Padding	0.053cm
Display When	Always
Reading Order	Context

See if you can find the property that will remove the line around text boxes and labels (Border Style)

Use the ‘Back Color’ property to change the colour of the Report Header.

Activity 3: Queries and Report (40 minutes) – 12 marks

Saving Activity 3 Report

Evidence your report as screenprints on your Notepad. Your screenprints must show:

- the **DESIGN** view of the report you have created, including grouping and
- calculations
- the **DESIGN** view of any queries you have created and used with the report,
- including fields and criteria
- the **DATASHEET** view of any queries you have created and used with the report.

Save report evidence as a PDF and attach to your Notepad

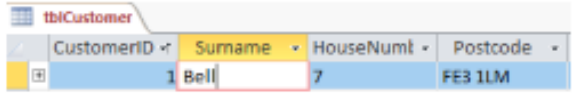
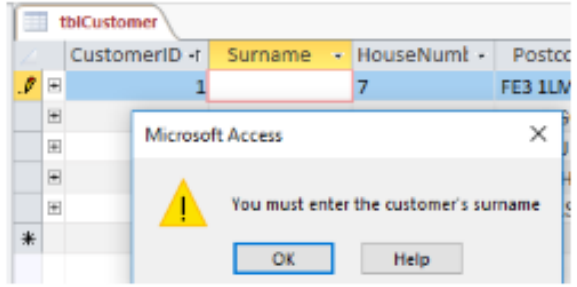
Activity 4: Structure Testing (20 minutes) – 6 marks

Test the structure of the validation of your relational database using suitable test data (normal, erroneous and extreme as appropriate).
You must provide evidence of table level testing that proves:

1. A record will not save without the surname being present
2. A record will not save if the postcode is not in the correct format
3. A record will not save if the event selected is invalid
4. A record will not save if the seat type is invalid
5. A record will not save if the number of tickets purchased is below the accepted range
6. A record will not save if the number of tickets purchased is above the accepted range

Complete the test log to show how you have tested the structure of your database on your Notepad

Activity 4: Structure Testing (20 minutes) – 6 marks

Test Number and Field	Type of test (N, R, X)	Test Data	Expected Results	Add Screenprints of the results (including any re-tests). Ensure you show the test data used.	Only complete this column if the results were not as expected. Explain the error.
1. Surname	N	Bell	Data will be accepted		
2. Surname	R	None - leave blank	Unable to save record		

N = Normal Data (correct data)
R = Abnormal Data (incorrect data)
X = Extreme Data (used in range checks to test the extreme range of the data – e.g. boundary data)

Activity 5: Structure Evaluation (20 mins) – 6 marks

Evaluate your database structure. You should consider:

- How well your database structure has minimised data duplication
- How well your database structure meets these requirements:
- There are two types of seat: seats without tables and seats with tables
- There must be at least one ticket purchased with each sale
- A sale cannot exceed eight tickets.

Save your evaluation as a PDF in your folder for submission as **activity5_[Registration number #]_[surname]_[first letter of first name]**

Activity 5: Structure Evaluation (20 mins) - 6 marks

BTEC Command Verbs

Pass

Describe	Give a clear description that includes all the relevant features – think of it as 'painting a picture with words'.
Define	Clearly explain what a particular term means and give an example, if appropriate, to show what you mean.
Design	Create a plan, proposal or outline to illustrate a straightforward concept or idea.
Explain	Set out in detail the meaning of something, with reasons. More difficult than describe or list, so it can help to give an example to show what you mean. Start by introducing the topic then give the 'how or 'why.
Identify	Point out or choose the right one or give a list of the main features.
Illustrate	Include examples or a diagram to show what you mean.
Interpret	Define or explain the meaning of something.
List	Provide the information in a list, rather than in continuous writing.
Outline	Write a clear description but not a detailed one.
Plan	Work out and plan how you would carry out a task or activity.
State	Write a clear and full account.
Summarise	Write down or articulate briefly the main points or essential features.

Merit

Analyse	Identify separate factors, say how they are related and how each one contributes to the topic.
Assess	Give careful consideration to all the factors or events that apply and identify which are the most important or relevant.
Compare/ Contrast	Identify the main factors that apply in two or more situations and explain the similarities and differences or advantages and disadvantages.
Demonstrate	Provide several relevant examples or related evidence which clearly support the arguments you are making. This may include showing practical skills.
Design	Create a plan, proposal or outline to illustrate a relatively complex concept or idea.
Explain in detail	Provide details and give reasons and/or evidence to clearly support the argument you are making.
Justify how/why	Give reasons or evidence to support your opinion or view to show how you arrived at these conclusions.

Distinction

Appraise	Consider the positive and negative points and give a reasoned judgement
Assess	Make a judgement on the importance of something – similar to evaluate.
Comment	Give your view after you have considered all the evidence. In particular critically decide the importance of all the relevant positive and negative aspects.
Criticise	Review a topic or issue objectively and weigh up both positive and negative points before making a decision.
Draw conclusions	Use the evidence you have provided to reach a reasoned judgement.
Evaluate	Review the information then bring it together to form a conclusion. Give evidence for each of you views or statements.
Evaluate critically	Decide the degree to which a statement is true or the importance or value of something by reviewing the information. Include precise and detailed information and assess possible alternatives, bearing in mind their strengths and weaknesses if they were applied instead.